

## REMARKS

This amendment is submitted in response to the non-final Office Action mailed on January 28, 2005. Claims 1-14 are pending in this application. Claims 8-11 have been withdrawn previously. In the Office Action, the specification is objected to, Claims 2-5 and 12 are rejected under 35 U.S.C. §112, second paragraph, Claims 1-7 and 12-14 are rejected under 35 U.S.C. §112, first paragraph, and Claim 7 is rejected under 35 U.S.C. §102. In response Claim 7 has been amended. This amendment does not add new matter. In view of the amendments and/or for the response set forth below, Applicants respectfully submit that the rejections should be withdrawn.

In the Office Action, the specification has been objected to. In response, the specification has been amended to address the informalities cited by the Patent Office. Accordingly, Applicants respectfully request that the objection to the specification be withdrawn.

In the Office Action, Claims 2-5 and 12 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Regarding Claims 2-5, Applicants respectfully submit that the term "nucleic acid" can refer to exogenous and endogenous nucleic acids and is fully supported in the specification. Thus, Applicants believe that it would be improper and unnecessary to add the limitation "exogenous" to Claim 2. Regarding Claim 12, Applicants have amended Claim 7, from which Claim 12 depends, to address the informalities cited by the Patent Office. Based on at least these noted reasons, Applicants believe that Claims 2-5 and 12 fully comply with 35 U.S.C. §112, second paragraph. Accordingly, Applicants respectfully request that the rejection of Claims 2-5 and 12 under 35 U.S.C. §112 be withdrawn.

In the Office Action, Claims 1-7 and 12-14 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Specifically, the Patent Office alleges that the specification fails to teach a transformed plant with reduced galactoside activity, increased galactose branching and increased solubility of coffee.

Applicants respectfully disagree and submit that one having ordinary skill in the art would be able to make/use the present claims based on Applicants' specification. The specification provides adequate guidance to one of ordinary skill in the art on how to make and

use the present claims for a transformed plant with reduced endogenous  $\alpha$ -D-galactoside activity and increased galactose branching resulting in increased solubility of coffee.

Applicants respectfully submit that the use of an antisense construct should reduce the level of expression of the corresponding gene. As the Patent Office recites, this may not always be the case, and the level of repression may be variable and unpredictable. However, there is evidence that that the construct works at some levels. For example, in the as-file specification, it was found that the antisense construct was at least expressed confirming the presence of the  $\alpha$ -galactosidase antisense mRNA in coffee embryos derived from transformed plants. See, specification, page 12, lines 16-27. Moreover, recent data for grain (beans) from the transformed plants indicates that the targeted  $\alpha$ -galactosidase gene does have reduced expression in transformed plants thereby demonstrating the reduction of  $\alpha$ -galactosidase antisense mRNA in accordance with the present claims.

Applicants note that compliance with the enablement requirement of 35 U.S.C. §112, first paragraph, does not turn on whether an example is disclosed. See MPEP 2164.02. An example may be "working" or "prophetic." A working example is based on work actually performed. A prophetic example describes an embodiment of the invention based on predicted results rather than work actually conducted or results actually achieved. *Id.* Accordingly, an applicant need not have actually reduced the invention to practice prior to filing. The specification need not contain an example if the invention is otherwise disclosed in such manner that one skilled in the art will be able to practice it without an undue amount of experimentation. *In re Borkowski*, 422 F.2d 904, 908, 164 USPQ 642, 645 (CCPA 1970).

Applicants respectfully disagree with the Patent Office's assertion that undue experimentation is necessary to arrive at the present claims. For example, the reduction of  $\alpha$ -D-galactosidase activity may be achieved by conventional methods of mutation and selection using the techniques available in the art. Plant cells may be subjected to mutagenic treatments, such as by exposing them to chemicals or radiation that bring about an alteration of the cell's DNA. The cells thus treated are subsequently screened for the desired property. Indeed, the present claims are within the capabilities of one having ordinary skill in the relevant art, although each person doing the experiment each time would have to screen to find the right plants (part of the state of the art). Barring a currently unanticipated reason, the antisense sequence and the construct

described in the specification should work to reduce the expression of this gene in the coffee grain as the whole gene sequence is used. Further, evidence in the specification indicates the construct working properly, and Applicants' recent experimental evidence with beans confirms it is working as expected thereby providing a reasonable expectation of success.

In the Office Action, Claims 1-7 and 12-14 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Specifically, the Patent Office alleges that the specification is not enabling for modification of the coffee plant cell so as to reduce  $\alpha$ -D-galactosidase activity using antisense oligonucleotides, thereby producing increased galactose branching of galactomannans and increase water solubility.

Applicants respectfully disagree and submit that one having ordinary skill in the art would be able to make/use the present claims based on Applicants' specification. As discussed previously, the specification provides adequate guidance to one of ordinary skill in the art on how to make and use the present claims for modification of the coffee plant cell so as to reduce  $\alpha$ -D-galactosidase activity using antisense oligonucleotides, thereby producing increased galactose branching of galactomannans and increase water solubility. Further, if the endogenous levels of  $\alpha$ -D-galactosidase activity was reduced, it is possible that the level of galactose units on the mannan chain would be increased and this could increase solubility and extractability. Thus, even a small relatively effective antisense nucleic acid could be sufficient to give a commercially relevant result in accordance with the present claims.

Based on at least these noted reasons, Applicants believe that Claims 1-7 and 12-14 fully comply with 35 U.S.C. §112, first paragraph. Accordingly, Applicants respectfully request that the rejection of Claims 1-7 and 12-14 under 35 U.S.C. §112, first paragraph, be withdrawn.

In the Office Action, Claim 7 is rejected under 35 U.S.C. §102(b) as anticipated by Cloning and Functional Expression of a cDNA Encoding Coffee Bean  $\alpha$ -galactosidase, Gene, vol. 140(2), pgs. 227-231, 1994 to Zhu and Goldstein ("Zhu"). Applicants respectfully disagree with and traverse these rejections for at least the reasons set forth below.

Applicants have amended Claim 7 to recite, in part, coffee beans obtained from the coffee plant according to claim 6 (i.e. a coffee plant containing a coffee plant cell that produces galactomannans and that is modified to reduce endogenous levels of  $\alpha$ -D-galactosidase activity in order to increase galactose branching of the galacto-mannans). The amendments as discussed above

are supported in the specification. Contrary to Claim 7, *Zhu* fails to disclose or suggest coffee beans obtained from a coffee plant containing a coffee plant cell that produces galacto-mannans and that is modified to reduce endogenous levels of  $\alpha$ -D-galactosidase activity in order to increase galactose branching of the galacto-mannans as required by the present claim. In fact, *Zhu* fails to disclose or even suggest the production of plants using antisense nucleic acid specifically expressed in the grain to make coffee beans with increased branching, thereby resulting in increased solubility in extracted coffee and increasing the amount of material extracted. For the reasons discussed above, Applicants respectfully submit that Claim 7 is novel, nonobvious and distinguishable from the cited reference.

Accordingly, Applicants respectfully request that the rejection of Claim 7 under 35 U.S.C. §102(b) be withdrawn.

For the foregoing reasons, Applicants respectfully request reconsideration of the above-identified patent application and earnestly solicit an early allowance of same.

Respectfully submitted,

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Dated: April 28, 2005